



Wireless Engineering Research and Education Center

Low-Complexity Channel-Aware Scheduling for Multichannel Wireless Local Area Networks

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Abstract

In multi-channel wireless networks, effective scheduling algorithms are indispensable for fully harvesting the benefit of multiple channels. Since scheduling decisions need to be made quickly under time-varying wireless channels and traffic dynamics, low-complexity algorithms are especially appealing. We study the problem of scheduling in multichannel wireless local area networks. We present a new class of polling service-based channel-aware scheduling algorithms, termed Regulated Channel-Aware Exhaustive Scheduling (RCES). The three proposed scheduling schemes are shown to have significantly reduced computational complexity, but achieve comparable delay performance as Maximum Weight Matching scheduling, the well-known optimal scheme, under various traffic patterns via simulation studies. The proposed schemes provide practical and effective solutions to the scheduling in multi-channel wireless networks.

Bio

Dr. Yihan Li received the B.S. and M.S. degrees from Tsinghua University, Beijing, P.R. China in 1993 and 1997, respectively, both in Electrical Engineering. She received the M.S. degree in System Engineering and the Ph.D. degree in Electrical and Computer Engineering from Polytechnic University, Brooklyn, NY, in 2000 and 2004, respectively. She was a research scientist in the Department of Electrical and Computer Engineering of Polytechnic University, New York, from 2004 to 2006. Currently, she is a postdoctoral researcher in the Department of Electrical and Computer Engineering, Auburn University, Auburn, AL. Her research interests include high-speed switching, wireless networking and sensor networks. She is a recipient of the 2001 International ACM Student Research Contest Award and the 2000 AT&T Student Research Symposium Award. She co-authored a textbook, TCP/IP Essentials: A Lab-Based Approach (Cambridge University Press, 2004).

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